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REPORT ON RAW MATERIALS BY THE JOINT COMMITTEE ON ATOMIC ENERGY

JULY 2, 1952.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. DURHAM, from the Joint Committee on Atomic Energy, submitted the following

REPORT

[NOTE.—The following is a partial text of a report on raw materials to the Congress by the Joint Committee on Atomic Energy. Portions of this report have been omitted for security reasons, and asterisks indicate omissions. All statements contained herein have been meticulously screened so as to include unclassified and publishable information only.]

The Raw Materials Subcommittee of the Joint Committee on Atomic Energy was established in mid-1951 when the chairman of the full committee wrote the following letter, in substance, to Senator Anderson:

JUNE 15, 1951.

DEAR SENATOR: There are a number of areas in the atomic energy raw materials field which I think need checking. I am particularly anxious that the joint committee make certain everything possible is being done to maximize the Nation's supply of uranium ores.

For this reason it occurs to me that a Subcommittee on Raw Materials could do some highly useful work, and I would like to appoint you as chairman. I have in mind Senator Millikin and Representatives Kilday, Jackson, and Elston as members. I think that if the subcommittee could submit a report to the full committee indicating whether or not the raw materials program is going forward with sufficient vigor and emphasis, this would be a real contribution to national defense.

I very much hope you will find it possible to take on the job.

BRIEN MCMAHON, *Chairman.*

The subcommittee has held a number of closed hearings with the Atomic Energy Commission, as well as conferences and executive session discussions. Several studies were undertaken both by the Commission and by the joint committee staff at the subcommittee's request. The comments which follow are necessarily general, for security reasons, but they reflect the subcommittee's over-all thinking.

The June 15, 1951, letter establishing the subcommittee requests an answer to the question of "Whether or not the raw materials program is going forward with sufficient vigor and emphasis." In reporting to the full committee on this question, the subcommittee desires to make four principal points:

1. * * * the Atomic Energy Commission should rapidly and substantially increase uranium and thorium production from domestic sources.

2. The United States has such great need for uranium and thorium that procurement from foreign sources should also be rapidly and substantially increased. Effort along these lines should reflect a sense of urgency created by full awareness of the possibility that at some future date certain foreign sources might be cut off.

3. * * *

4. The military cannot escape responsibility for fixing weapon requirements at whatever level needed to defend the United States most effectively and cheaply. * * * Considering the possibility that foreign ore sources might be cut off, considering the inability of our own country to control the timetable and the intentions of a potential enemy, and considering the possibility that our military will continue to revise upward their estimates of minimum weapon needs, the rate of ore procurement should be rapidly increased * * *.

These findings, based upon the testimony before the subcommittee, require explanation and comment.

I. CURRENT DOMESTIC PROGRAMS

Uranium ore output within the United States remains a fraction of total output from the free world, and likewise a fraction of our total national demands. This is true even though domestic production has risen sharply over the past 2 or 3 years following moderate efforts to increase tonnage.

The subcommittee places heavy stress upon the objective of reducing the dependence of the United States upon foreign sources of uranium ore. * * * This is extremely important; for it is likely to remain true for a number of years that, because of inadequate domestic production, any stoppage in the flow of ore from overseas would expose the continuity of operation of some of our national atomic energy production plants to the most serious threat. The answer is two-pronged—prompt increase of both foreign and domestic supplies.

The Commission's domestic ore program first got under way in late 1948 on an exceedingly modest scale. It concentrated mainly upon the Colorado Plateau area, which has now become an important contributor to the atomic energy project and is today the only significant domestic source of supply. During the past 18 months, the Commission has undertaken a considerably increased exploration effort on the Colorado Plateau, consisting of geological studies and a diamond-drilling program designed to locate ore.

In the early postwar years, the belief came to prevail that the availability of uranium ores imposed a narrow and rigid limit upon atomic production. Responsible officials stated that this was the case although something on the order of 5 percent or less of the then comparatively restricted amounts spent by the Atomic Energy Com-

mission were devoted to all phases of uranium procurement, included exploration.

The following table, derived from the unclassified postwar atomic energy budgets, shows the relationship between total money spent and the percentage of this money devoted to exploration, ore purchase, and processing into feed for Oak Ridge and Hanford. Unfortunately, security reasons require that the figures both for ore procurement and also for the first major step in the production chain—that is, converting the raw ore into feed materials—be lumped together. Nevertheless, the table is instructive:

	Raw and feed materials cost	Total AEC costs	Percentage
Actual fiscal year 1948	$35, 500, 000	$672, 000, 000	5.3
Actual fiscal year 1949	36, 000, 000	632, 000, 000	5.7
Actual fiscal year 1950	48, 700, 000	567, 000, 000	8.6
Actual fiscal year 1951	59, 600, 000	859, 000, 000	7.0
Estimated fiscal year 1952	109, 000, 000	1, 716, 000, 000	6.4
Estimated fiscal year 1953	148, 000, 000	1, 744, 000, 000	8.5
Total	436, 800, 000	6, 190, 000, 000	[1] 7.1

[1] Average.

Actually, it was true during the early postwar years, as it is true today, that the quantity of uranium ore obtainable rises or falls with the degree of effort exerted to this end. Just as iron or copper or gold or virtually any other raw material may be produced in greater quantities, given time and given a willingness to pay the necessary cost, so uranium may also be procured in greater quantities, likewise given time and given a willingness to pay the necessary cost. Members of the joint committee representing States where mining is an important industry have long maintained that such is the case.

In the Colorado Plateau area the Commission owns and operates, through a contractor, an ore-processing mill at Monticello, Utah. Privately owned vanadium mills have been rebuilt to recover uranium, and these are located at Durango, Naturita, Uravan, and Rifle—all in Colorado. New mills, also privately owned, have recently come into operation at Grand Junction, Colo.; and Salt Lake City, Utah. Still another mill, small and privately owned, processes copper uranium ores at Hite, Utah. Ore-buying stations today operate as an adjunct to each mill, and four other stations are established at Marysvale, Utah, Thompson, Utah, Shiprock, N. Mex., and Grants, N. Mex. Moreover, two new ore-buying stations are scheduled for early operation at Green River, Utah, and Edgemount, S. Dak. At Grants, N. Mex., a new uranium mill is under construction.

Production to date has come largely from the old vanadium mining areas of western Colorado and eastern Utah. To the south and west of this region, along the Colorado River, lies an area as large as New England and embracing some of the roughest country in the United States. Here is a great desert and mountain region essentially without roads or water, but containing many miles of outcrop, which, we are informed, encourages exploration for the development of uranium.

According to testimony before the subcommittee, the Florida phosphate fertilizer industry offers a unique opportunity for early large-scale uranium recovery as a by-product. The phosphates of

other regions, such as the Idaho-Montana area, are potentially interesting.

Uranium also occurs in shale deposits located in the States of Kentucky, Ohio, Indiana, and elsewhere.

The subcommittee specifically recommends a far larger and accelerated exploration activity and diamond drilling program on the Colorado Plateau along with the necessary access roads for exploration and recommends a rapidly expanded development program of known commercial deposits and those discovered by exploratory programs.

The subcommittee has been informed that sound processes are in hand for practical and speedy recovery of uranium as a byproduct of the Florida phosphate fertilizer industry, heretofore referred to, and on this assumption recommends an expeditious large-scale production program.

The subcommittee further recommends that research on the problem of extracting uranium from phosphates in parts of the country other than Florida, and for extracting uranium from shales be accelerated by devoting larger resources and a greater sense of immediacy in solving the problems involved.

Generally speaking, the scope and scale of the Commission's efforts to locate new deposits and sources of uranium should be expanded. Too much emphasis can hardly be placed upon the fact that active prospecting for uranium within the United States has been under way for less than 4 years and in a country as large and as rich in mineral wealth as our own, it is a virtual certainty that good producing areas exist but have yet to be located.

Great emphasis must also be placed upon the limited nature of the research program thus far undertaken to devise ways and means of processing low-grade ores. While the situation here has improved somewhat over the past year, a more vigorous research program is still much needed to seek out all opportunities for obtaining uranium where it appears only in diffuse amounts.

II. THERE IS NO URANIUM BOTTLENECK

As the full committee pointed out in its October 19, 1951, report to the Congress:

> The Raw Materials Subcommittee, under the chairmanship of Senator Anderson, is conducting a series of hearings and inquiries which have already demonstrated that the uranium situation has substantially improved and promises to improve still further.
>
> Committee members have emphasized their finding that within broad limits, the United States may obtain as much uranium as it desires for defense purposes provided that the cost is deemed to be worth while. Much has been accomplished by way of eliminating the widespread but faulty assumption that uranium ore receipts must be a rigidly fixed quantity, and establishing as fact that supplies will vary with the amount of money, manpower, and effort directed toward obtaining them.

Although there was little validity to the official doctrine that uranium ore supplies were rigidly limited, this doctrine did in fact play a key role in early decisions as to the scope and scale of our national atomic production effort. The residual effect of the same doctrine, moreover, is visible even in recent atomic production decisions.

A principal point which the subcommittee wishes to make as regards the availability of uranium ore is this: Within wide limits which have

yet to be approached, the military are free to recommend allocating as large a share of the total national defense budgets to the quantity production of atomic weapons as they deem advisable. In other words, so far as uranium raw materials are concerned, the military may ask for and get—following several years of "lead time"—as many bombs as they consider to be necessary to deter war or to win a war quickly if it comes.

Two statements by the Chairman of the Atomic Energy Commission, Mr. Gordon Dean, tend to illustrate this point. At a press conference held on December 10, 1951, he indicated that, from the standpoint of raw materials, atomic production capacity could be expanded by at least 150 percent over and above levels then programed. Speaking in Chicago on February 1, 1952, he indicated that the new atomic expansion program meanwhile announced by the President would in fact increase plant investment by approximately 100 percent over and above levels previously program.

The Raw MaterialsSub committee feels strongly that responsibility rests squarely upon the military to propose assigning to atomic production whatever share of the total national defense budgets as will best guard our country and that this responsibility can in no wise be avoided on the basis that uranium raw material must limit output. To state the matter differently, if war should come some years hence and if the United States did not then possess as many atomic weapons relative to other types of armament as would have been desirable, there could be no valid exoneration of either the military or higher authority in terms of uranium shortage.

The Commission is to be commended for its efforts to secure the raw materials needed to sustain production output levels thus far proposed by the military. It should be reemphasized, however, that at one time such output levels were geared importantly to an assumption that raw materials rigidly limit production. The assumption inclined to become self-confirming, since—with military requirements so fixed—the Commission did not see fit to obtain raw materials well in excess of amounts necessary to fulfill the requirements. In brief, the requirements were related to comparatively rigid rates of raw materials procurement, and those rates, in turn, tended to remain rigid because requirements could be met without expanded effort. Fortunately, after a short period, the Joint Committee on Atomic Energy intervened and broke this closed cycle of cause and effect. Nevertheless, the fact that such intervention was necessary at all underscores the present need for the most vigorous and broad-gaged raw materials program.

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It should be remembered, too, that plutonium and uranium-235 are not the only fissionable materials; there is also uranium-233, derived from thorium. A very substantial revision upward in both uranium and thorium procurement goals would promote the common defense and security.

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